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A Retrospective Study Regarding Coronavirus Disease Epidemiological Features among People in Fallujah City, Iraq

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Abstract

Background: A corona virus (COVID-19) pandemic in Iraq has extended all over the country, including Fallujah city in western of Iraq. Being aware of the epidemiological features of this novel disease can greatly assist in making the suitable decisions regarding the management and thus control of this epidemic.

Objective: To study the epidemiological characteristics of COVID-19 patients in Fallujah city, Iraq.

Methods: In this retrospective study, information in regard to the epidemiological features of COVID-19 suspected cases who underwent polymerase chain reaction (PCR) testing at Fallujah Teaching Hospital in Fallujah, Al-Anbar, Iraq, from September 12th, 2020 to January 5th, 2021. Inclusive, have been collected, analyzed and then reported. General features including age, sex, occupation and quarantine site were investigated. Whole data were retrieved from patients' official records.

Results: A total 3604 samples from COVID-19 suspected cases were collected, 575 cases of them were tested positive for COVID-19. Among the COVID-19 patients, 402 of them were males (69.9%) and 173 were females (30.1%). The age range of the patients was (15-86) years and the mean age ±SD was 40.98±14.3 years. Forty-one COVID-19 patients were healthcare workers (7.1%) and the rest 534 patients had non-healthcare related occupations (92.9%). Only 40 COVID-19 positive cases were admitted to the hospital (7%), and 535 patients were in home quarantine (93%). In case of the total 143 hospital admitted patients, the PCR test results were negative in 103 patients (72%) and positive in only 40 patients (28%).

Conclusion: This study found that COVID-19 was more prevalent among the young male individuals, whom represent the community active group. This study can serve in documenting the features of the patients with COVID-19 in Fallujah, Iraq, and also in helping the healthcare workers in detecting and managing the patients.

Keywords: COVID-19, Coronavirus, epidemiology, SARS-CoV-2, Iraq

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List of abbreviations: COVID-19 = Corona Virus Diseases - 19, MERS = Middle east respiratory syndrome, RT-PCR = Real-time polymerase chain reaction test, SARS–COV-2 = Severe acute respiratory syndrome coronavirus 2

Introduction

Since emerging in Wuhan city, China, in December, 2019, the coronavirus disease 2019 epidemic has developed hastily into a pandemic [(1)]. On the 30th of January, 2020, the World Health Organization (WHO) officially announced that the coronavirus disease 2019

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epidemic represents a serious threat to the world public health, and subsequently, in March 2020, the rapid spread of the disease internationally resulted in announcing the coronavirus disease 2019 pandemic [2]. Accordingly, the term COVID-19 (stands for coronavirus disease 2019) was decided as the official name for the disease, and SARS−COV-2 (stands for severe acute respiratory syndrome coronavirus 2) for the causative virus [3,4]. Similar to the Middle East Respiratory Syndrome (MERS) and the severe acute respiratory syndrome (SARS), the trend of COVID-19 has been seen in the epidemiology of this new emergent disease [5,6]. The nature of SARS-CoV-2 virus and the long incubation period indicates that COVID-19 is highly contagious disease, in which every infected person is able to infect at least 3 other persons [7,8].

An individual is said to be COVID-19 suspect when primarily presents with respiratory symptoms such as cough, shortness of breath and fever [9,10]. COVID-19 is associated with a wide range of clinical signs and symptoms including respiratory and non-respiratory manifestations. Even though the majority of the cases present with mild symptoms, some cases can be complicated into developing severe respiratory diseases and pneumonia as far as developing venous thrombosis, renal and heart failure [11].

There are various methods to diagnose COVID-19, such as nasopharyngeal or oropharyngeal swab reverse transcriptase polymerase chain reaction test (RT-PCR), viral detection from sputum sample or bronchoalveolar lavage, the rapid antigen detection test and chest radiograph [12]. The nasophaygeal swab is considered the standard method for screening or diagnosis of COVID-19 [13].

Iraq, along with other countries around the world attained COVID-19 mainly through individuals who have history of travel abroad. The first confirmed COVID-19 case in Iraq was reported on the 24th of February, 2020 in Al-Najaf city, south of Baghdad. While Baghdad, the capital of Iraq, reported the largest share (about 40%) of conformed cases at that time [14].

The rapid spreading of COVID-19 across Iraq could be explained by the fact that thousands of Iraqis had travelled outside Iraq visiting countries like Iran during the spring break which made them more liable to catch the COVID-19. In addition, upon their return home, they did not face any obligatory quarantines, which has led to the increase in the risk of spreading the infection to their families, neighbors and friends [15].

Since the emerging of COVID-19 pandemic last year, a large number of studies around the world, including Iraq, have been done to study the epidemiological characteristics of the patients with COVID-19. Studying the epidemiological features of this novel disease will help in making appropriate decisions and thus control the epidemic [14,16-18]. So, this study is aiming to investigate and report the basic epidemiological topographies of COVID-19 patients in Fallujah, west Iraq as a city with a population of more than 350 thousand people.

Methods

Data sources

Data for this study was obtained from the official records at the Central Laboratory of Fallujah Teaching Hospital after obtaining the relative approval. Data covered cases reported in the first five months of the second wave of epidemic (from September 12th, 2020 to January 5th, 2021 inclusive) in Fallujah City, West Iraq. Additional sources were also viewed to verify the accuracy of numbers reported.

Definitions

The participants included in this study were all the COVID-19 suspected cases seeking PCR tests at Fallujah Teaching Hospital. A suspected case of COVID-19 is defined as any individual presented to any designated health institutions with symptoms suggestive of COVID-19 or with a history of a recent contact with a COVID-19 positive patient. The individual is said to be a

COVID-19 patient when it is confirmed by clinical picture and a positive nasopharyngeal swab (RT-PCR) [9,10].

Data analysis

General information regarding the age, sex, occupation and quarantine site from all the subjects were obtained, and the information were entered into a Microsoft Office (Excel) sheet. The data analysis was carried out using the Statistical Package for Social Sciences (SPSS) software, version 24. Descriptive analysis was carried out to estimate the frequencies and percentages of each variable in all the cases and in the PCR test positive cases.

Ethical issue

Ethical approval for this study was obtained from the Scientific Committee of University of Fallujah, College of Medicine. A research proposal was also approved by the Central Research Committee at the Directorate General for Health in Al-Anbar, Iraq.

Results

Information from a total 3604 COVID-19 suspected cases were collected for this study. Fifty-three cases were excluded from the data analysis because of missed information. Of those 3551 remaining cases, 2467 were males (69.5%) and 1084 were females (30.5%). The age range of the participants was (3-86) years and the mean age ±SD was 37.75±13.93.

Out of the 3551 suspected cases, 3408 were in home quarantine (96%) and only 143 were admitted to the hospital (4%). In term of occupation, 3338 COVID-19 suspected subjects were non-healthcare workers (94%) and 213 subjects were healthcare workers (6%). Table 1 summarizes the general epidemiological features of all the participants in this study. The PCR tests results showed that 575 cases tested positive for COVID-19 (16.2%), and 2976 cases tested negative (83.8%).

Table 1. Epidemiological characteristics of COVID-19 suspected cases in Fallujah, Iraq (from September 12th, 2020 to January 5th, 2021)

Variable		Frequency	Percentage (%)
Gender	Male	2467	69.5%
	Female	1084	30.5%
Age group (years)	1-18	161	4.5%
	19-29	955	26.9%
	30-39	1001	28.2%
	40-49	694	19.5%
	50-59	413	11.6%
	≥60	327	9.3%
Occupation	Healthcare worker	213	6.0%
	Non-healthcare worker	3338	94.0%
Quarantine site	In hospital	143	4.0%
	Home quarantine	3408	96.0%
PCR result	Positive	575	16.2%
	Negative	2976	83.8%

N=3551

Table 2 demonstrates the general epidemiological features of the 575 patients tested positive for COVID-19; 402 patients were males (69.9%) and 173 patients were

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females (30.1%). The age range of the patients was (15-86) years and the mean age ±SD was 40.98±14.303 years. Forty-one COVID-19 patients were from healthcare workers (7.1%) and the rest 534 patients had non-healthcare related occupations (92.9%). Only 40 COVID-19 positive cases were admitted to the hospital (7%), and 535 patients were in home quarantine (93%). In case of the total 143 hospital admitted patients, the PCR test results were negative in 103 patients (72%) and positive in only 40 patients (28%).

Table 2. Epidemiological characteristics of COVID-19 patients in Fallujah, Iraq (from September 12th, 2020 to January 5th, 2021)

Variable		Frequency	Percentage (%)
Gender	Male	402	69.9%
	Female	173	30.1%
Age group (years)	1-18	12	2.1%
	19-29	119	20.7%
	30-39	154	26.8%
	40-49	129	22.4%
	50-59	87	15.1%
	≥60	74	12.9%
Occupation	Healthcare worker	41	7.1%
	Non-healthcare worker	534	92.9%
Quarantine site	In hospital	40	7.0%
	Home quarantine	535	93.0%

N=575

Discussion

The present study intended to investigate and document the basic epidemiological features of the patients with COVID-19 in Fallujah city, Iraq from the period of September, 12th, 2020 to January, 5th, 2021. During this period, only 3604 persons underwent nasopharyngeal swap RT-PCR test at Fallujah Teaching Hospital, and 575 patients infected with COVID-19 were diagnosed. One explanation to the small number of the PCR tests carried out could be due to the public fear from the pandemic and the hospitals, whom they mainly rely on the private medical cares. Furthermore, some patients could be diagnosed with COVID-19 by other means, such as the rapid antigen detection tests or chest radiology without undergoing the nasopharyngeal swap (PCR) test [19].

The general epidemiological characteristics of the COVID-19 patients showed that the majority of the patients were young age males and this finding agrees with the previous predominant in males worldwide like [20,21]. The male predominance finding can be explained by the differences between males and females regarding their immune responses to COVID-19 infection, as well as, women are usually less susceptible to viral infections in comparison to men, based on a different innate immunity, factors related to sex chromosomes and steroid hormones [22].

An interesting finding in the current study is that the majority of the patients admitted in the COVID-19 unit at Fallujah Teaching Hospital were PCR negative (72%). The high negative PCR results were also found in other studies [23,24] Arevalo-Rodriguez and colleagues (2020), found that up to 54% of COVID-19 patients had false-negative RT-PCR results initially (very low certainty of evidence), and that repeating the testing in patients with suspicion of SARS-Cov-2

infection is important to overcome any false-negative results [24]. Also, Lindner and colleagues [8] suggested that one of main reasons leading to false-negative RT-PCR results in COVID-19 patients is the technique of performing the nasopharyngeal swab in which the swab was generally rotated against the nasopharyngeal wall for less time than recommended by the manufacturer. And this may affect the sensitivity of the test with nasopharyngeal sampling, but also reflects the difficulty of collection of this sample type [25].

This study has a number of limitations; the information gained were accessed to from the official records which were lacking details about the presenting symptoms, the duration of the symptoms and any co-morbidities due to this study was performed in a single center. Also, authors did not have access to the clinical outcomes of the admitted cases in term of cure and mortality rates.

In conclusions, the results of current study found a higher incidence of COVID-19 among the young and male individuals, whom represent the active age group in the community, which has been mentioned earlier in other studies. Findings from this study will serve in documenting the features of the patients with COVID-19 in Fallujah city, Iraq, and also in helping the healthcare workers in detecting and managing the patients.

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Author contribution
All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

Conflict of interest
The authors declare that there is no conflict of interest.

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